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NXP, B.V.
NXP INTELLECTUAL PROPERTY DEPARTMENT
M/S41-SJ
1109 MCKAY DRIVE
SAN JOSE, CA 95131

EXAMINER

VANCHY JR, MICHAEL J

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 01/09/2008 have been fully considered but they are not persuasive. The applicant argues that the prior art fails to teach "the areas of the image that are determined are each filtered exclusively with a single Gabor filter adapted to the given direction," however, the examiner respectfully disagrees. Based on the amendment made by the applicant, the examiner has changed his rejection from a 102(e) to a 103(a) single reference rejection. The prior art (Reisman et al., U.S. Patent No. 7,142,699 B2) teaches using 8 Gabor filters, however, each Gabor filter is used to segment the image into 8 different directions (col. 6, lines 39-51) and (col. 8, lines 7-10). These directions are 0, 22.5, 45, 67.5, 90, 112.5, 135, and 157.5 degrees respectfully. The applicant states "If four different directions were determined previously, it is therefore possible to generate areas containing eight different directions and for these areas each to be filtered with a Gabor filter aligned to suit them." Therefore, it is obviously possible to change from 8 filters to 4 filters, each being "exclusively" used on each direction. The applicant displays the 4 and 8 filter embodiment in figures 1 and 2, where the filters are shown with their degrees of direction. Thus, based on the prior art it would be obvious to use 4 or 8 Gabor filters each exclusively filtering a given direction.
2. The objection made to claim 8 has been resolved.
3. The "provisional" type double patenting is still applicable.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claim 1 is provisionally rejected on the ground of nonstatutory double patenting over claim 1 of copending Application No. 10/541,910. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: filtering images of skin prints using Gabor filters.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other

copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1-5, 9, 10, 12, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reisman et al., 7,142,699 B2.

Re claim 1, a method of binarizing images containing linear structures, and particularly images of prints from the skin (Reisman et al., col. 6, lines, 25-26 and 31-33), characterized in that areas are determined that are each distinguished by a preset approximate direction of the structures and in that the areas of the image that are determined are each filtered exclusively with a single Gabor filter adapted to the given direction (Reisman et al., col. 6, lines 40-52).

Re claim 2, a method as claimed in claim 1, characterized in that the determination of the areas takes place, tile by tile of the tiles into which the image is divided, with further Gabor filters of corresponding directions (Reisman et al., col. 7, line 64 to col. 8, line 10).

Re claim 3, a method as claimed in claim 2, characterized in that four further Gabor filters are used (Reisman et al., col. 6, lines 39-40).

Although Reisman et al. uses eight Gabor filters one of ordinary skill in the art can recognize that the method stated in Reisman et al. can be done with four by eliminating four of the filters.

Re claim 4, a method as claimed in claim 3, characterized in that the directions of the further Gabor filters are determined by angles of 22.5.degree., 67.5.degree., 112.5.degree. and 157.5.degree. to an edge of the image (Reisman et al., col. 7, lines 1-3 and lines 16-18).

Although Reisman et al. uses eight Gabor filters one of ordinary skill in the art can recognize that the method stated in Reisman et al. can be done with four by eliminating four of the filters. The four filters that would be eliminated in this case would be 0, 45, 90, and 135 degrees.

Re claim 5, a method as claimed in claim 2, characterized in that, for the determination of the areas from the filter responses tile by tile of the tiles into which the image is divided, a variance is derived in each case from the given filter response and in that tiles having a variance that is greater than a preset threshold value are assigned to the given area (Reisman et al., col. 7, line 64 to col. 8, line 10).

Re claim 9, a method as claimed in claim 1, characterized in that the surface area of the areas so far determined is established and in that areas whose surface area is of less than a preset size are suppressed (Reisman et al., col. 6, lines, 9-39).

Re claim 10, a method as claimed in claim 9, characterized in that the surface area is established by tracing the outlines of the areas by means of an edge-tracing algorithm (Reisman et al., col. 6, lines 37-38).

Re claim 12, a method as claimed in claim 1, characterized in that the image is binarized prior to the filtering with Gabor filters adapted to direction (Reisman et al., col. 6, lines, 25-26 and 31-33).

Re claim 13, a method as claimed in claim 12, characterized in that, to allow the image to be binarized, a threshold value is derived from a histogram of the image covering those pixels in which there is clear information on direction (Reisman et al. col. 6, lines 9-24), and in that the threshold value is selected in such a way that half of the pixels are lighter than the threshold value and half are darker (Reisman et al., col. 6, lines, 31 -33).

Re claim 15, system (Reisman et al., col. 1, lines 16-18) for binarizing images containing linear structures, and particularly images of prints from the skin, using a method according to claim 1 (Reisman et al., col. 6, lines, 25-26 and 31-33).

1. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reisman et al., 7,142,699 B2 as applied to claim 1 above, and further in view of Ort et al., 5,926,555.

Reisman et al. and Ort et al., both describe a fingerprint enhancement and identification system, however, Reisman et al. is silent on using smoothing filters for enhancement. Although, Ort et al. does use smoothing filters:

Re claim 8, a method as claimed in claim 1, characterized in that the pixels are adapted to the environment, as predominant at the time, of the given pixel by smoothing filters (Ort et al., col. 16, lines 57-63).

Therefor taking the combined teachings of Reisman et al. and Ort et al. as a whole, it is clear to one with ordinary skill in the art to use smoothing filters in finger enhancement and to modify Reisman et al. to include such filters.

Claim 14 is rejected under Reisman et al., however, Reisman et al. is silent on “further binarization” the examiner takes official notice that this method is notoriously well known and expected in the art and therefore would have been obvious to incorporate.

Re claim 14, a method as claimed in claim 12, characterized in that further binarization takes place after the filtering with Gabor filters adapted to direction. Examiner takes official notice that “further binarization” is common within the art.

Allowable Subject Matter

2. Claims 6, 7, and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Re claim 6, a method as claimed in claim 5, characterized in that the derivation of the variances is performed for tiles that overlap one another.

Re claim 7, a method as claimed in claim 6, characterized in that, at a resolution of approximately 500 dpi, the size of the tiles used for deriving the variance is 16.times.16 pixels, which tiles are each processed in steps of eight pixels.

Re claim 11, a method as claimed in claim 2, characterized in that tiles for which, when direction was determined, the response of one of the Gabor filters gave a recognizable direction, are filtered with a Gabor filter adapted to this direction, in that tiles for which, when direction was determined, the responses of the Gabor filters gave two adjoining recognizable directions, are filtered with a Gabor filter adapted to the mean direction, and in that tiles for which no direction was determined or for which, when direction was determined, the responses of the Gabor filters gave two non-adjacent directions, are not filtered.

3. Claims 16 and 17 are allowed.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Vanchy Jr. whose telephone number is (571) 270-1193. The examiner can normally be reached on Monday - Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on (571) 272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael J. Vanchy Jr.
Examiner
AU 2624
(571) 270-1193

/Samir A. Ahmed/

Supervisory Patent Examiner, Art Unit 2624